nag_random_continuous_uniform_ab (g05dac)

1.   Purpose

nag_random_continuous_uniform_ab (g05dac) returns a pseudo-random real number taken from a uniform distribution over the interval $[a, b]$.

2.   Specification

```
#include <nag.h>
#include <nagg05.h>

double nag_random_continuous_uniform_ab(double a, double b)
```

3.   Description

This distribution has PDF (probability density function)

$$
\begin{array}{rcll}
f(x) & = & 1/|a - b| & \text{if} \quad x \in [a, b] \\
f(x) & = & 0 & \text{otherwise}
\end{array}.
$$

The function returns the value

$$x = a + (b - a)y$$

where y is a pseudo-random number from a uniform distribution over (0,1), generated by nag_random_continuous_uniform (g05cac). The function ensures that x lies in the closed interval $[a, b]$.

4.   Parameters

a
b
    Input: the end-points a and b of the distribution. It is not necessary that $a < b$.

5.   Error Indications and Warnings

None.

6.   Further Comments

6.1.   References

Knuth D E (1981) *The Art of Computer Programming (Vol 2)* (2nd Edn) Addison-Wesley.

7.   See Also

nag_random_continuous_uniform (g05cac)

8.   Example

The example program prints the first five pseudo-random real numbers from a uniform distribution between 1.0 and 1.5, generated by nag_random_continuous_uniform_ab after initialisation by nag_random_init_repeatable (g05cbc).

8.1.   Program Text

```
/* nag_random_continuous_uniform_ab(g05dac) Example Program
 *
 * Copyright 1990 Numerical Algorithms Group.
 *
 * Mark 1, 1990.
 */

#include <nag.h>
#include <stdio.h>
#include <nag_stdlib.h>
#include <nagg05.h>

main()
{
  Integer seed = 0;
  Integer i;

  Vprintf("g05dac Example Program Results\n");
  g05cbc(seed);
  for (i=1; i<=5; i++)
    Vprintf("%10.4f\n",g05dac(1.0, 1.5));
  exit(EXIT_SUCCESS);
}
```

8.2.   Program Data

None.

8.3.   Program Results

```
g05dac Example Program Results
    1.3976
    1.1129
    1.1856
    1.1125
    1.4394
```